



ANTHELMINTIC EFFECT OF TAMARIND INDICA LINN LEAVES JUICE EXTRACT ON PHERETIMA POSTHUMA

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ABSTRACT –

The aim of present study is to evaluate Anthelmintic potential of juice of *Tamarind Indica Linn* leaves using *Pheretima posthuma* as test worms. Various concentrations (100%, 50%, 20%) of *Tamarind indica linn* leaves juice were tested in the assay, which involved determination of time of paralysis (P) and time of death (D) of the worms.

It show shortest time of paralysis (P=23.5 min) and death (D=62min) in 100% concentration, while the time of paralysis and death will increase in 50% concentration (P=26min&D=65min) and in 20% concentration (P=30min&D=72min) respectively as compare to Piperazine citrate (10mg/ml) used as standard reference (P= 23 min& D= 60) and distilled water as control. The results of present study indicated that the juice of *Tamarindus indica linn* leaves showed significantly demonstrated paralysis, and also caused death of worms especially at higher concentration as compared to standard reference Piperazine citrate and control.

From the result it is conclude that the juice of *Tamarindus Indica linn* leaves showed significant Anthelmintic activity.

KEY WORDS: *Pheretima posthuma* , Anthelmintic, *Tamarindus Indica linn* leaves,
Piperazine citrate.

ANTHELMINTIC EFFECT OF TAMARIND INDICA LINN LEAVES JUICE ON EARTHWORMS (PHERETIMA POSTHUMA)

INTRODUCTION:

The World Health Organization estimates that a staggering two billion people harbor parasitic worm infections. Parasitic worms also infect livestock and crops, affecting food production with a resultant economic impact. Despite this prevalence of parasitic infections, the research on anthelmintic drug is poor. As per WHO, only few drugs are frequently used in the treatment of helminthes in human beings. Anthelmintics from the natural sources may play a key role in the treatment of these parasite infections (Aswar Manoj et al.2008). *Tamarindus Indica* Linn (Caesalpinaceae) is tropical plant found all over the different parts of India. It has been used in the indigenous system of medicine for the treatment of various ailments. Several therapeutic uses as fever, jaundice, scabies, Anthelmintic and wounds have been ascribed to the leaves of *Tamarind Indica* (Anonymous, 1950). Literature survey revealed that there is no report available regarding Anthelmintic activity of *Tamarindus Indica* Linn leaves. The present study was, therefore undertaken to evaluate the in vitro Anthelmintic activity of crude juice of *Tamarind Indica* Linn.leaves against *Pheretima posthuma*.

Objective: To analyze and detect the effective use of Tamarind Indica linn.

MATERIALS AND METHOD

Worms Collection

Indian earthworm *P. posthuma* were collected from the water logged area of soil, Pune.

Indian adult earthworms (*Pheretima posthuma*) were used to study anthelmintic activity. The earthworms were collected from the water logged area of soil, Pune., washed with normal saline to remove all fecal matter. The earthworms of 5-8 cm in length and 0.2-0.3 cm in width were used for all experimental protocol.

Plant collection and Authentication:

The leaves of *Tamarind Indica* linn were collected from the area around Pune in September 2008, Identified and authenticated in the department of Agarkar research Institute, Pune.

Preparation of juice

The fresh leaves of *Tamarindus Indica* linn of Family Caesalpinaceae were collected from area around Pune and identified in department of Pharmacognosy at our Institute. The leaves were washed thoroughly to remove adhered material and grind thoroughly in mixer .The material was filtered through Whatman filter paper no.40 and filtrate was

collected .The prepared juice was diluted with the help of distilled water in varying concentration as follows, 100 % concentration , 50 % concentration, 20 % concentration.

EXPERIMENTAL DESIGN:

The Anthelmintic assay was carried as per the method of Mali R.G.et al, 2007; Aswar Manoj et al., 2008., with minor modifications.Indian adult earthworms (*Pheretima posthuma*) of 5-8 cm in length and 0.2-0.3 cm in width were used. The animals were divided into Five groups containing six earthworms in each group. 50 ml Preparation containing three different concentrations (100%, 50% and 20% in distilled water) were prepared and the standard drug solution were poured in different petridishes. All the earthworms were washed in normal saline solution before they were used. Six worms (same type) in each were placed in it. Time for paralysis was noted when no movement observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water (50°C). Piperazine citrate (10mg/ml) was used as reference standard while distilled water as control.

STATISTICAL ANALYSIS:

The result were express as Mean \pm SEM. Statistical analysis was carried out using one way ANOVA followed by the student-t test. P<0.05 was considered statistically significant.

Table 1: In vitro evaluation of anthelmintic activity *Tamarindus indica linn* Leaves

Test subs	Concentration	Time for paralysis (min)	Time for Death (min)
Piperazine citrate	(10mg/ml)	23 \pm 0.68	60 \pm 0.93
T.I. leaves Juice	100%	23.5 \pm 0.31 ^{a***}	62 \pm 0.77 ^{a ***}
T.I. leaves Juice	50 %	26 \pm 0.53 ^{a,b,d**}	65 \pm 0.96 ^{a,b,d **}
T.I. leaves Juice	20 %	30 \pm 0.59 ^{a,b,c **}	72 \pm 0.77 ^{a,b,c**}

All the data are expressed as mean \pm SEM and analyzed by ANOVA followed by Dunnett Multiple Comparisons Test,(n=6). * = p<0.01, ** = p<0.001 .

T.I. Leaves Juice –*Tamarindus indica* leaves juice

- a = comparison with normal control
b = comparison with 100% conc.juice
c = comparison with 50% conc.juice
d = comparison with 20% conc.juice

RESULTS AND DISCUSSION

Anthelmintic activity of *Tamarindus indica linn* Leaves is confirmed by examining the time taken for paralysis (P) and death (D) for *Pheretima posthuma* worms were reported in **Table 1**.

Preliminary Phytochemical analysis showed the presence of carbohydrates, flavonoids, pectin, tartaric acid, and dihydrobutanedioic acid and tannins like phytoconstituents in the juice of *Tamarindus indica linn* Leaves.

The assay was performed on adult Indian earthworm, *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings (Nirmal SA et al.2007). Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds in vitro (Sollmann.1918; Shivkar and Kumar 2003). Piperazine citrate by increasing chloride ion conductance of worm muscle membrane produces hyperpolarisation and reduced excitability that leads to muscle relaxation and flaccid paralysis (R.J.Martin, 1985),

As shown in **Table 1** concentrated Juice of *Tamarindus indica linn* exhibited Anthelmintic activity in dose dependent manner taking shortest time for paralysis (P) and death (D) with 100 % concentration. Phytochemical analysis of juice of *Tamarindus indica linn* Revealed the presense of tannins. Tannins were shown to produce anthelmintic activities (Shrestha Bhupendra et al., 2009). Chemically tannins are polyphenolic compounds. Some synthetic phenolic anthelmintics e.g. niclosamide, oxiclozanide, bithionol etc., are reported to interfere with energy generation in helminth parasites by uncoupling oxidative phosphorylation (Mali R.G.2007). Another possible anthelmintic effect of tannins is that they can bind to free proteins in the gastrointestinal tract of host animal (Athnasiadou et al.2001) or glycoprotein on the cuticle of the parasite (Thompson & Geary et al.1995) and may cause death.

Hence juice of *Tamarindus indica linn* leaves in its different conc. exhibited Anthelmintic activity. It show shortest time of paralysis (P=23.5 min) and death (D=62min) in 100% conc., while the time of paralysis and death will increase in 50% conc.(P=26min&D=65min) and in 20% conc.(P=30min&D=72min) respectively. The standard reference drug Piperazine citrate showed the same effect at 23 and 60 minutes, respectively. The predominant effect of Piperazine citrate on worm is to cause a flaccid paralysis those results in expulsion of the worm by peristalsis. Thus

juice of *Tamarindus indica linn* leaves showed significant Anthelmintic activity as compare to standard reference and control.

CONCLUSION:

From the result, it is conclude that the juice of *Tamarindus Indica linn* leaves showed significant anthelmintic activity. when compared with the standard anthelmintic drug The drug may be further explored for its phytochemical profile to identify the active constituent responsible for anthelmintic activity.

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